POWER LINE WARNING LIGHT APPARATUS

BACKGROUND OF THE INVENTION

Field of Invention

[0001] This invention relates to a flashing light fixed on a power line. The flashing light has a set of iron core and coil, which transfer the magnetic field induced by the current in the power line to a voltage source. The voltage source further charges a capacitor in an increasing voltage charging circuit, so that the voltage on the capacitor is charged to a predetermined high voltage. The high voltage then triggers a circuit of the flashing light so as to light up a flash lamp. After the capacitor is discharged by the flash lamp, the increasing voltage charging circuit charges the capacitor again, which is for the next flashing and discharging process.

Related Art

[0002] Conventional power lines (electric power transmission lines) are usually hanged with pylons, and the electric power is transferred through decades, or even hundreds of kilometers from power plants to power transformer stations in cities. The pylons and power lines usually threaten the flying vehicles in low altitudes due to their heights, especially in the night or poor vision weather. Accordingly, it is one of the best caution methods to install flashing lights on the power lines as a warning marker.

SUMMARY OF THE INVENTION

[0003] Regarding the above-mentioned problem, it is an objective of the invention to provide an apparatus, which can provide a warning flashing light on a power line to caution pilots of the aviation vehicles in low altitudes. Thus, the pilots can tell the position of the power line and prevent a collision. In this invention, an annular iron core surrounds a power line, so that a magnetic flux generated by an annular magnetic field, which is induced

by the current flowing in the power line, appears in the iron core. An enameled coil further winds on the iron core so as to obtain an induced voltage source promptly from two terminals of the enameled coil. Furthermore, the voltage source connects to an increasing voltage charging circuit, so as to charge a capacitor. When the voltage of the capacitor is charged to a predetermined high voltage, a flash lamp is then triggered and turned on, and the capacitor is discharged by the flash lamp at the same moment. After the capacitor is discharged and the flash lamp is turned off, the increasing voltage charging circuit charges the capacitor again for the next flash. As a result, a periodic flash can be obtained.

BRIEF DESCRIPTION OF THE DRAWINGS

[0004] The present invention can be more fully understood by reading the subsequent detailed description and examples with references made to the accompanying drawings, wherein:

[0005] FIG. 1 is a schematic illustration showing a power line warning light apparatus according to a preferred embodiment of the invention; and

[0006] FIG. 2 is a circuit connection diagram of the power line warning light apparatus according to the preferred embodiment of the invention.

DETAILED DESCRIPTION OF THE INVENTION

[0007] Referring to FIG. 1, the power line warning light apparatus of the invention consists of an iron core 1, an enameled coil 2, an increasing voltage charging circuit 3, and a flash lamp 4. The iron core 1 surrounds over a power line 5, and the entire circuitry of the apparatus is fixed on the power line 5. Moreover, the enameled coil 2 is wound on the iron core 1. The output terminal of the enameled coil 2 is connected to the increasing voltage charging circuit 3, and the output terminal of the increasing voltage charging circuit 3 is connected to the flash lamp 4. When an alternating current is flowing in the power line 5, an

annular alternating electromagnetic field is induced around the power line 5. The alternating electromagnetic field can induce a magnetic flux in the iron core 1, and a voltage on the enameled coil 2 is then obtained. The increasing voltage charging circuit 3 increases the voltage output from the enameled coil 2, and then charges the increased voltage to the flash lamp 4 to light it up.

[0008] The circuit connection diagram of the power line warning light apparatus according to the preferred embodiment of the invention ~~the increasing voltage charging circuit 3 in the apparatus of the invention~~ is shown in FIG.2. ~~An~~The iron core ~~21~~1 surrounds the power line 5 (as shown in FIG. 1), and ~~a~~the coil ~~22~~2 is wound on the iron core ~~21~~1. The coil connects to a charging circuit 3, which includes a transformer 31, a diode 32, a capacitor 33, a resistor 34, a capacitor 35, a neon lamp 36, a silicon controlled rectifier 37, and a transformer 38. The output terminal of the coil ~~22~~2 connects to the input terminal of ~~a~~the transformer ~~23~~31. One output terminal of the transformer ~~23~~31 connects to ~~a~~the diode ~~24~~32, and the other output terminal of the transformer ~~23~~31 connects to a common ground wire of the increasing voltage charging circuit 3. The output terminal of the diode ~~24~~32 connects to ~~a~~the capacitor ~~25~~33, ~~a~~the resistor ~~26~~34, and ~~a~~the flash lamp ~~31~~4. The capacitor ~~25~~33 and the flash lamp ~~31~~4 further connect to the common ground wire, respectively. The resistor ~~26~~34 further connects to ~~a~~the capacitor ~~27~~35, ~~a~~the neon lamp ~~28~~36, and one input terminal of ~~a~~the transformer ~~30~~38. The capacitor ~~27~~35 further connects to the common ground wire, and the neon lamp ~~28~~36 further connects to the gate of ~~a~~the silicon controlled rectifier ~~29~~37. One output terminal and the other input terminal of the transformer ~~30~~38 connect to the anode of the silicon controlled rectifier ~~29~~37, and the cathode of the silicon controlled rectifier ~~29~~37 connects to the common ground wire. The other output terminal of the transformer ~~30~~38 connects to the trigger plate of the flash lamp ~~31~~4. To be noted, the neon lamp 36 can be

substituted with any fixed voltage triggered device, such as an SCR (Silicon Controlled Rectifier) firing circuit (not shown).

[0009] In the embodiment, the iron core ~~21~~1 surrounds the power line 5, so that the magnetic flux is induced in the iron core ~~21~~1 by the electromagnetic field around the power line as the current flows through it. Thus, a voltage can be induced at the output terminal of the coil ~~22~~2, which is wound on the iron core ~~21~~1. The voltage will be increased to an alternating voltage in the magnitude of about 280 volts by the transformer ~~23~~31 and then output from the transformer ~~23~~31. After the diode ~~24~~32 and capacitor ~~25~~33 rectifies and filters the output voltage from the transformer ~~23~~31, a direct current (DC) voltage in the magnitude of about 400 volts is obtained finally. The DC voltage charges the capacitor ~~27~~35 via the resistor ~~26~~34. When the voltage of the capacitor ~~27~~35 increases over 90 volts, it light up and conduct the neon lamp ~~28~~36. The current through the neon lamp ~~28~~36 flows to the gate of the silicon controlled rectifier ~~29~~37, so as to conducts the anode and cathode of the silicon controlled rectifier ~~29~~37. Consequently, a current flows to the input terminal of the transformer ~~30~~38, and a high voltage output in the magnitude of 2000 to 4000 volts is then transformed with and output from the transformer ~~30~~38. The high voltage is connected to the trigger plate of the flash lamp ~~31~~4 and triggers the flash lamp ~~31~~4 to flash. It should be noted that when the flash lamp ~~31~~4 flashes, the voltage of the capacitor ~~25~~33 is discharged correspondingly. Thus, the flash lamp stops flashing when the voltage of the capacitor ~~25~~33 is discharged. At this moment, the neon lamp ~~28~~36 is turned off and the whole circuit starts over the charge sequence for the next flash.

[0010] In summary, the power line warning light apparatus of the invention has the following advantages of:

1. It provides a high luminance flash warning to aviation vehicles in low altitudes

and avoids their collisions with power lines.

2. It is driven by the power transmitted in the power line and can be used to monitor the power status. For example, no flash indicates that the current in the power line breaks off.

3. It is fixed on the power line directly, and additional equipments and power sources are unnecessary.

4. It is easy to install since the only work to do is to fix it to the power line.

5. It has a small volume and is light-weighted, which does not increase the loading of the power line significantly.

[0011] Although the invention has been described with reference to specific embodiments, this description is not meant to be construed in a limiting sense. Various modifications of the disclosed embodiments, as well as alternative embodiments, will be apparent to persons skilled in the art. It is, therefore, contemplated that the appended claims will cover all modifications that fall within the true scope of the invention.